project WEB

spring 2002

Connecting Projects WILD, WET and Learning Tree in New Hampshire

Get Out and Explore

This edition of Project WEB encourages you to get outside and explore the natural world! Longer days, warmer sunshine, bursting buds and migrating birds beckon us to celebrate their return. Feisty kids with spring fever are also strong motivators to move the classroom outside and expend excess energy.

MARILYN WYZGA PHOTO © NHF&G

Use your creative side when recording observations.

Make the most of your time outside by using field guides. Before venturing out, introduce your students to written keys and in the process, enhance their vocabularies and observation skills. Ask students to develop their own keys for identifying trees and shrubs, birds and other natural features of your schoolyard. The use of nature journals will help them to extend their written keys into illustrated field guides. Then, have students compare and contrast their individual field guides to examples of the many published guides on the market. All the tools you need to venture on this course of exploration are here for you. So get outside, learn and enjoy! WEB

IN THIS ISSUE

Keying Across the Curriculum

By Kathe Cussen, Hampstead Middle School

As you open a field guide to identify a natural history "mystery item," you will likely come across a written key. This key is a step-by-step aid that relies heavily upon observation of details and understanding of specific vocabulary. These written keys stand in contrast to field guides that rely on matching your "mystery item" to illustrations and photographs.

Many keys are "dichotomous," meaning two choices of clues or traits are offered at each step. It is up to you to decide which of the two traits fits your mystery object. Then the key sends you to the next step and closer to identifying your item.

The art of using and creating keys calls upon a variety of essential skills. First, to successfully "key out" a particular object, you must be familiar with the vocabulary specific to your topic. For example, a field guide for trees will ask you whether the leaves are opposite or alternate, simple or compound, lobed or not, and more. Second,

KEYING *continued on page 4*

I have learned that what I have not drawn I have never really seen, and that when I start drawing an ordinary thing I realize how extraordinary it is, sheer miracle: the branching of a tree, the structure of a dandelion's seed puff.

Frederick Franck
The Zen of Seeing

Choosing a Field Guide

Selecting the right field guide for your needs can be daunting. A trip to the local bookstore to prepare this article found eight shelves dedicated just to guides on birds, and twenty more shelves for butterflies, mushrooms, trees, ferns, insects, fish, wildflowers and more. Venture onto the internet and prepare yourself to discover some amazing "virtual field guides." An abundance of websites allows you to learn about nearly any plant or animal, as close as your backyard and as far away as central Africa. As you begin the fun journey of selecting a field guide, consider these questions to help you narrow your search.

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Learning to use a field guide can be challenging – but it's always fun.

How experienced are you with field guides?

If you are new to them, explore guides designed for beginner naturalists. Common series include Peterson's First Guides, Peterson's Field Guides for the Young Naturalist, and Stokes Beginner Series. These series cover common species and provide simple keys for identification.

What terms and identification keys are you accustomed to?

Field guides rely on terms, charts, and keys to help you identify specific species. Check the introduction for directions on how to use the guide. It should include definitions of its terms and a clear description of how to use its key.

Do you want a guide to use in the field?

If so, look at the size, construction, and weight of the guide. Will it stand up to the wear and tear of outside use? Is it easily portable? Several guides are sized to fit in your pocket or backpack. Some very simple ones come as laminated cards.

Do you want a guide to use as a desk reference?

Many guides are best suited as desk references. They are much more comprehensive and detailed in content, comprising several hundred pages. The Sibley Guides to Birds and Birdlife and Behavior are good examples. Virtual field guides on the internet are also good desk references. Enature.com is easy to use and offers a complete guide to more than 4,800 North American plants and animals.

What geographic region are you exploring?

Some field guides focus on a specific state or region, while others cover all of North America. For ease of use, select a guide that is as specific to your region of interest as possible.

What natural features are you interested in?

Do you want a guide to identify all the plants and animals of an area, or just a single element? The National Audubon Society Guide to New England offers a nice guide to many of our region's plants and animals. By contrast, you may select a guide focused on birds of prey, shorebirds, backyard birds, edible plants and more.

With these questions in mind, you will be able to refine your search for an effective field guide. Remember that many of our local environmental centers offer popular field guides for sale and their staffs are well suited to help you select the right one for your needs. WEB

Using a Field Guide

Field guides help you positively identify the plants and animals you see. No matter which field guide you choose (see Choosing A Field Guide), here are several hints for how to use them.

Read the Introduction

The first step in learning how to use your field guide is to read the introductory pages.

These pages will offer you a wealth of information. Most guides include specific tips on using the guide. In some cases, there is advice about using the guide in the field as well as how to use it at home as a reference. The length of the introductory section can vary from one or two pages to more than a dozen. No matter what field guide you are using, you should become familiar with its general layout and special features before you go into the field.

Definitions

All field guides will include either in the introduction or the appendices a list of terms used in the guide. Become familiar with these terms and how they are applied to the book you are using. This will allow you to use the guide quickly and, in the case of something that is moving like a bird, allow you to make a swifter identification.

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Field guides are just one tool helpful in identifying birds (above). An adult mentor (right) helps children learn how to use a field guide.

Taxonomic Groupings

In general, field guides for vertebrate species are arranged in accepted taxonomic sequence for orders and families. Learning the characteristics of like species including their size, shape, length of legs and color will allow you to turn quickly to the section of the guide where you would find them.

In the case of plant guides for wildflowers, trees and ferns, they may also be placed in taxonomic groups. Again, learning the specific characteristic of each group will allow identification to happen at a faster rate. Even in wildflower guides that are based on color, they will have each color section arranged by taxonomic groups usually going from simple to more complex flowers.

Other Hints

Once you think you have made a positive identification from looking at the drawing, painting or picture, read the description to make sure it matches. When confirming birds and mammals, check the range maps to make sure you would find the animal where you are located. Feel free to make notations in your field guide next to the illustration or picture that will help you better remember specific characteristics about what you have just identified. In addition, you might want to make note of when and where you were when you identified the species. You might also find that by adding tabs or by making color stripes for different taxonomic groups you will be able to locate species faster in your field guide. WEB

KEYING *continued from page 1*

using keys requires detailed observation skills in order to compare your specimen to the written clues. Once armed with these skills, it is very rewarding for children and adults to follow a key to completion and successfully uncover the identity of a mystery object.

Introducing Students to Keys

The "key" to teaching students to use written keys is to start simply by using familiar concepts and items. To introduce the skill, brainstorm and record a visual word map of students' connections to the word "key." Then collect an assortment of five pens and pencils from students. Hold the collection up and have the students observe and describe the similarities and differences among the pens and pencils. Ask them for ways to divide the pens and pencils into only two groups. Possible answers include "plastic vs. wood" or "pens vs. pencils." The class must decide on only one distinction. Record this choice on the board.

If the choice is "pens vs. pencils," the next step is to hold up just the pencils and develop another way to separate them into only two groups. Possible answers may by "erasers vs. no erasers" or "painted vs. natural." Write this second distinction on the board, followed by a symbol to guide the reader to the next choice in your key. Continue developing distinctions between your pens and pencils, until the group of five pens and pencils is divided into five single-item groupings. These final groups may be labeled "Jack's pen," "Emily's pencil," and so on. After constructing the pen and pencil key, randomly choose one pen or pencil and "key it out" to see if the key works.

Following the pen and pencil key exercise, students should be ready to follow a simple teacher-generated key set up outside the school. Tie colored surveyor's tape to one leaf on six different trees. Each piece of tape should have a different number. Have students use the teacher-generated key to determine the identity of each numbered leaf and record their results on an answer sheet.

As student confidence grows, they may begin to write and share their own keys.

As student confidence grows, they may begin to write and share their own keys. Additionally, these sequential activities may serve as enrichment activities for motivated students and as a means of alternate and performance assessment for all.

MARILYN WYZGA PHOTO © NHF&G

While using keys in the outdoors requires essential skills, the experience of discovery and identifying objects can be very rewarding.

Using and creating keys incorporates valuable student skills including observing, collecting data, measuring, sorting, comparing and contrasting, designing solutions to problems, and communicating. WEB

Activities Related to Articles in This Issue

Project Learning Tree suggests:

The Closer You Look develops students' observation skills by closely examining the structure of a tree and then drawing it.

Name That Tree introduces students to the essential vocabulary of a tree's structural characteristics, including styles of leaf tips and bases, leaf margins, leaf arrangements, types of bark and more.

In *The Fallen Log*, students examine a decaying log for fungi, moss, lichen, wildflowers, sprouts, insects, amphibians and more.

Project WET suggests:

In *Wetland Soils in Living Color*, students develop a simplified version of a Munsell soil chart, a type of guide used to classify soils.

During the Wrap-Up of *Macroinvertebrate Mayhem*, field guides are used to identify aquatic macroinvertebrates to assess a stream's health.

Students identify vernal pools and the organisms living in them through the use of field guides in *Life in the Fast Lane*.

Project WILD suggests:

Use Drawing on Nature to create a field guide for your community.

Field guides are a must for conducting a *Bird Song Survey*.

Interview a Spider has students gathering natural history information about wildlife.

Nature Journaling and Observation

BY CLARE WALKER LESLIE

Excepts from the essay "Teaching Nature Journaling and Observation" in the book *Into the Field: A Guide to Locally Focused Teaching*, published by the ORION SOCIETY.

The nature journal is not a new phenomenon in the history of scientific study, or for that matter, in the history of liberal arts education. It springs from an ancient tradition of record keeping: tribe, village or parish records; farming ledgers; native people's accounts of seasons and hunts; records of scientific expeditions; travel journals; accounts of investigations by self-taught naturalists; units of study in rural schools.

Luckily it is not really necessary to draw well in order to teach nature journaling.

The heart of nature journaling is the learning of observation skills, rather than drawing skills. Even beginners soon sense the usefulness of creating a visual record of their observations.

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Keeping a journal of observations becomes a record of one's experiences.

The following are some suggested exercises:

1. Students take out their journals. On the top of a blank paper, they put the date and their names.

2. Below the date, they write where they are. Ask them to consider why place is important to a record when setting up a study.

3. They note the time of day.

4. They write down the present weather (temperature, barometric pressure, and length of day may also be included).

5. Take the students outdoors, in silence. Ask them to listen and write down three sounds under the heading "I hear…" Then ask them to write a brief stream of consciousness sentence or poem.

6. Looking at the ground, the students should find three contrasting leaf shapes, either of groundcover plants or fallen leaves. Use simple line drawings and label the size, color and key feature of the leaf, as well as the name of the plant if they know it. Each drawing takes no more than two minutes.

7. Looking at eye level, ask the students to draw three objects they see at eye level.

8. Draw leaves, using blind contours. Ask students to sit down in a ring and pick up one leaf to draw. They have to look at it very carefully, turning it in various positions, to try to really see it well. Then, without looking at their paper, and without lifting their pencil once, they draw the whole outline, all the veins within, and any insect nibbles.

9. Drawing a tree, using blind contour. If the class has never drawn a tree before, suggest trying to do a blind contour first. The act of doing a blind contour forces five-year olds and fifty-five year olds alike to see a tree as the tree is, not as they think it is. I find it the fastest and best exercise to get any student drawing, no longer frozen in fear and frustration.

10. The full landscape: If there is time, have students draw a 3-by-5 or 6-by-7 box and in it draw a shape map of the landscape in front of them. The steps are as follows:

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Working in small groups is one way to have students explore the outdoors.

• Begin with the top of the trees, or mountains, or water, as it meets the sky. Draw a line where the sky and land meet.

• Drop down to the bottom of that vertical land mass and draw where trees and ground meet.

• Using simple images, draw in the trees, buildings, cars, or whatever you see within the view in front of you.

• Label what you draw and write any other topical information underneath such as location, time of day and weather.

11. Along the way: While a class is drawing, unexpected events may occur: rabbits hop by, a crow screeches into a tree, perhaps a hawk swoops past or even an owl. I always tell the students to stop whatever they are doing and quickly sketch what may vanish. I often yell out, "Draw now! Identify later."

Claire Walker Leslie is a nationally recognized wildlife artist, naturalist, educator and the author or *Keeping a Nature Journal*, *The Art of Field Sketching*, *Nature Drawing: A Tool for Learning* and many other books. She has taught nature journaling and field sketching for over 25 years.

Teaching Nature Journaling and Observation was originally published in the book *Into the Field: A Guide to Locally Focused Teaching*. For ordering information contact The Orion Society at 888/ 909-6568 or visit their website www.oriononline.org. WEB

Exhibition Inspires Look At Land Use In New Hampshire

"Claiming the Land: Our Past, Our Future, Our Choice," is a new exhibition at the MUSEUM OF NEW HAMPSHIRE HISTORY that looks at New Hampshire's historic use of our land and water and encourages visitors to consider carefully what kind of a world they will leave to future generations. It features a major new exhibition on view through March 2004 and is enhanced by educational programs and community forums to improve awareness of thoughtful land use policies and practices. It also offers visitors a panorama of 20 landscape paintings of New Hampshire scenes, including images by Thomas Hill, Frederic Church and William Titcomb, as well as Melissa Miller and Paul Gray.

"Choice, Change, and the New Hampshire Landscape" is a new hands-on component to the new exhibition for students in grades 4-12. Students will compare Native American and English concepts of the land and learn how the state's water resources helped shape the Industrial Revolution. Our professionally trained museum teachers will also place the conservation movement within the context of the logging and tourism industries of the late 1800s. Students will also understand that the choices we make today will shape how New Hampshire looks in the future. For more information, contact Mark Foynes, Director of Education, at (603) 856-0611. (NH history lessons and Book I of the NH History Curriculum are available online at www.nhhistory.org.)

The exhibition is a joint project of the NEW HAMPSHIRE HISTORICAL SOCIETY and the SOCIETY FOR THE PROTECTION OF NEW HAMPSHIRE FORESTS. The museum is located at 6 Eagle Square in Concord. Museum admission is $5 for adults, $4 for seniors, $2.50 for children, with a family maximum of $15. For more information call (603) 228-6688.

Make a Splash with Project WET

More than 30,000 students throughout the country, including students in New Hampshire, will celebrate water during the third annual *Make A Splash with Project WET Day*, September 27, 2002. This year's NH festival is being held in the SACO RIVER WATERSHED. Schools in the area north of Lake Winnipesaukee and east of Waterville Valley will be invited to attend. For more information, contact Nicole Clegg at (603) 271-4071 or nclegg@des.state.nh.us. Also contact us if your school or district is interested in being considered as a site for this annual event in 2004.

Community Mapping

This GIS course for educators, community leaders and others runs June 13, July 8-12, July 15-19 and July 22-23 at the NH COMMUNITY TECHNICAL COLLEGE in Littleton. The course will combine learning about natural resources management and planning with developing skills in using GIS software. Participants will map natural resources and explore protection strategies for their communities. Participants will receive a CD with data for their community. Participating schools will receive a free ArcView®3.2 site license, courtesy of ENVIRONMENTAL SYSTEMS RESEARCH INSTITUTE. (Sorry, only schools are eligible to receive the software.) See a course brochure at http://ceinfo.unh.edu/Water/Documents/CommMapb.pdf. For more information, contact Sharon Hughes at (603) 862-1029 or sharon.hughes@unh.edu

The Boston TEE (Total Environmental Education) Party

The NORTH AMERICAN ASSOCIATION FOR ENVIRONMENTAL EDUCATION is hosting its *2002 Conference at the Park Plaza Hotel* in Boston from August 6-10, 2002. The theme is based on the concept of environmental education being a rich education that encourages and encompasses diversity in the pursuit of sustainable futures. Four strands will address Environmental Education through Time, Designing and Planning Spaces for People, Environmental Justice and Diversity, and the Role of Higher Education in Environmental Education. For more information, go to http://naaee.org/conferences/index.php or call (706) 764-2926.

Watershed Ecology

Watershed Ecology is a ten-day summer course from August 5-9 and August 12-16 on an undergraduate and graduate-level geared towards science educators and community leaders. The course is coordinated by staff from the NH FISH AND GAME DEPARTMENT. Each day specialists will focus on a particular aspect of watershed ecology. Hands-on, experiential learning is emphasized in both field and classroom settings. The course offers techniques for applying science in real world situations. For information contact: Laura Ryder, NH Fish and Game Dept., 2 Hazen Drive, Concord, NH 03301 or (603) 271-3212.

Schoolyard Habitat Grants Available

Are you doing a project on schoolyard habitat? The NH FISH AND GAME DEPARTMENT is pleased to announce that schoolyard habitat grants are available. The grants are made possible as part of the *NH Conservation License Plate* program. For details call Marilyn Wyzga at (603) 271-3211 or email mwyzga@wildlife.state.nh.us.

Wildflower Fest

Woodlands and meadows teeming with wildflowers mark the awakening of the forest after a long winter's nap. Join Forest Society staff at The Rocks in Bethlehem on June 2 to learn about identifying wildflowers and their uses. For more information, go to www.therocks.org or call (603) 444-6228.

MARILYN WYZGA PHOTO © NHF&G

Wild native bee balm.

ON THE H.O.M.E. FRONT

Using Field Guides in the Outdoor Classroom

BY MARILYN WYZGA

The articles in this newsletter have given you some good instruction on the best use of field guides. Now you can apply those skills to exploration in the outdoors.

What You Can Do with Field Guides in the Outdoor Classroom

Create a personalized field guide to your nature area or nature trail. Have students write the entries and illustrate them. Add to the guide as new organisms are discovered. Use published field guides to complete site inventory activities on the schoolyard site.

Inventory Activities Using Field Guides

Animal Sign

(Recommended field guide: *Tracking and the Art of Seeing: How to Read Animal Tracks and Sign*; Paul Rezendes.)

Materials: Bucket to hold tools, animal tracks field guide, plastic bags or other clear containers, paper, pencil, sketch map of schoolyard site

Procedure: Locate as many different animal signs as you can on the schoolyard site. Sign can mean anything you observe or otherwise sense that suggests the past or present occurrence of animals on the site, such as actual sightings, sounds or calls, burrows, dens, nests, partially-consumed food, carcasses, tracks, feathers, fur, droppings, etc. The term "animal" can mean anything from an insect to a mammal. (Note: do not collect any specimens with bare hands.)

Whenever possible, name or speculate on the name of the animal that you think goes with each sign. Draw a sketch of at least two of the signs. Make notes about the area where the sign was found, and any other clues that might help you identify the animal that made the sign. On the sketch map, indicate the approximate location of each sign discovered.

The term "animal" can mean anything from an insect to a mammal.

In the field or in the classroom, use the field guide to determine what animal left the sign. What animal seems to be the most abundant on the schoolyard site? Which animal leaves the most visible evidence?

Most Common Plants

(Recommended field guide: *Newcomb's Wildflower Guide*)

Materials: Tree, shrub and herb books; bucket for samples, paper, pencil, clipboard.

Procedure: Find what appears to be the most common tree, the most common shrub, and the most common herb (non-grass or turf) of the schoolyard site. Use the following definitions as guidelines:

Tree: Erect, woody plant, typically with singular stem or trunk, usually growing to large size 10-12 ft. or above

Shrub: Woody plant, erect or non-erect (i.e. sprawling, trailing, or vine-like), typically multi-trunked (i.e. with more than a single stem coming out of the ground), usually smaller than tree in stature

Herb: Ground plant with fleshy tissue (non-woody)

Sketch the key parts of each plant: stem, leaf, flower, fruit, etc. Collect a small sample of each plant.

(Note: *Be sure you and your students can accurately identify poisonous plants such as poison ivy, poison oak or poison sumac before going outside.*)

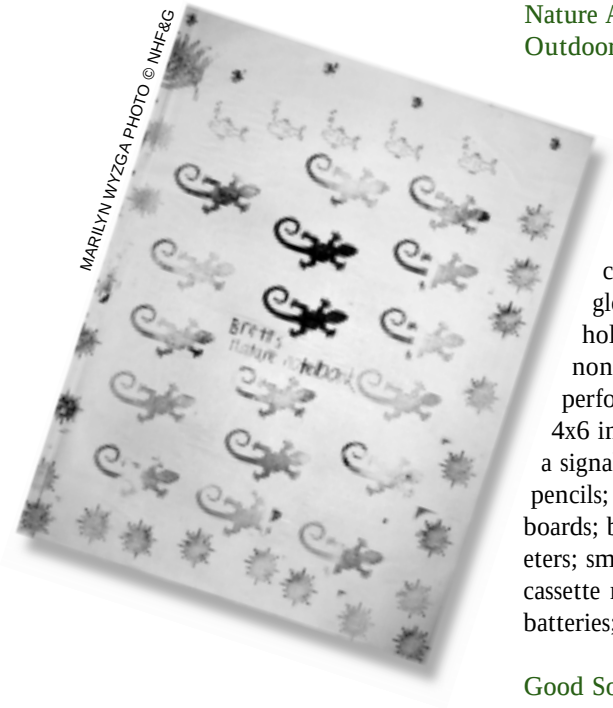
Use field guides to determine the names of the most common plants you find.

OUTDOOR CLASS *continued on page 8*

MARILYN WYZGA PHOTO © NHF&G

While completing a schoolyard inventory, students often make detailed observations with the aid of a field guide.

OUTDOOR CLASS *continued from page 7*



Nature Area Kits to Explore the Outdoor Classroom

Here is a list of items you can assemble into an outdoor study kit for your classroom, to supplement your use of the field guides and enhance your exploration of the outdoor classroom: kid-sized garden gloves; terrarium or other large holding container; variety of clear, non-breakable containers with perforated lids; rolls of string/twine; 4x6 index cards; animal call (to use as a signal with groups); packages of pencils; track cards; laminated clip-boards; big sturdy pond nets; thermom-eters; small trowels; camera and film; cassette recorder, microphone, tapes, batteries; field guides.

Good Sources of Supplies and Field Guides

- Delta Education, Nashua, NH
- Acorn Naturalists Catalogue, (800) 422-8886, www.acornnaturalists.com

My favorite all-around field guide: *National Audubon Field Guide to New England*, Peter Alden and Brian Cassie, Chanticleer Press, 1998, NY: Geology, fossils, wildlife habitats, weather, night sky, wildflowers, trees, mushrooms, mammals, insects, reptiles, fishes and more.

My favorite on-line field guide: www.enature.com

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